We claim:

1. A method of performing a clear channel assessment in a wireless network, comprising:

listening for channel energy on a wireless channel;

demodulating the channel energy into a non-synchronized in-phase component and a non-synchronized quadrature phase component;

squaring the non-synchronized in-phase component;

squaring the non-synchronized quadrature phase component;

multiplying the non-synchronized in-phase component and the non-synchronized quadrature phase component to produce an I-Q product;

subtracting the squared non-synchronized quadrature component from the squared non-synchronized in-phase component to produce a first intermediate value;

doubling the I-Q product to produce a second intermediate value;

adding the first intermediate value and the second intermediate value to produce a clear channel assessment input value;

performing a carrier signal detection function on the clear channel assessment input value to produce a clear channel assessment output value; and

using the clear channel assessment output value to determine whether a signal is present in the wireless channel.

2. A method of performing a clear channel assessment in a wireless network, as recited in claim 1, wherein the carrier signal detection function is a fast Fourier transform function.

3. A method of performing a clear channel assessment in a wireless network, as recited in claim 2, wherein the carrier signal detection function is a decimated fast Fourier transform function.

4. A method of performing a clear channel assessment in a wireless network, as recited in claim 1, wherein the carrier signal detection function is a band pass filtering function.

5. A method of performing a clear channel assessment in a wireless network, as recited in claim 1, wherein the step of using the clear channel assessment output value to determine whether a signal is present in the wireless channel is performed by determining if the clear channel assessment output value is greater than a set threshold value.

6. A method of performing a clear channel assessment in a wireless network, as recited in claim 1, wherein the step of listening for channel energy further comprises: performing a variable gain amplification function on the channel energy before the channel energy is demodulated.

7. A method of performing a clear channel assessment in a wireless network, as recited in claim 6, further comprising:

performing an absolute value function on the clear channel assessment input value to produce a feedback signal,

wherein the feedback signal is used to control the variable gain amplification function.

8. A method of performing a clear channel assessment in a wireless network, as recited in claim 1, further comprising: filtering any frequency components in the non-synchronized in-phase component above a low pass threshold before the step of squaring the non-synchronized in-phase component.

9. A method of performing a clear channel assessment in a wireless network, as recited in claim 1, further comprising: filtering any frequency components in the non-synchronized quadrature phase component above a low pass threshold before the step of squaring the non-synchronized quadrature phase component.

10. A method of performing a clear channel assessment in a wireless network, as recited in claim 1, wherein the step of demodulating the channel energy further comprises:

generating a base oscillating signal having a base center frequency;

mixing the channel energy with the base oscillating signal to obtain the non-synchronized in-phase component;

shifting the base oscillating signal in phase by 90 degrees to obtain a shifted oscillating signal; and

mixing the channel energy with the shifted oscillating signal to obtain the non-synchronized quadrature phase component.

11. A method of performing a clear channel assessment in a wireless network, as recited in claim 10, wherein the base center frequency is 4.104 GHz.

12. A method of performing a clear channel assessment in a wireless network, as recited in claim 10, wherein the base center frequency is between 3.1 and 5.1 GHz.

13. A method of performing a clear channel assessment in a wireless network, as recited in claim 10, wherein the base center frequency is 8.208 GHz.

14. A method of performing a clear channel assessment in a wireless network, as recited in claim 10, wherein the base center frequency is between 6 and 10.6 GHz.

15. A method of performing a clear channel assessment in a wireless network, as recited in claim 1, wherein the step of demodulating the channel energy further comprises:

generating a base oscillating signal having a base center frequency;

mixing the channel energy with the base oscillating signal to obtain the non-synchronized quadrature phase component;

shifting the base oscillating signal in phase by 90 degrees to obtain a shifted oscillating signal; and

mixing the channel energy with the shifted oscillating signal to obtain the non-synchronized in-phase component.

16. A method of performing a clear channel assessment in a wireless network, as recited in claim 15, wherein the base center frequency is 4.104 GHz.

17. A method of performing a clear channel assessment in a wireless network, as recited in claim 15, wherein the base center frequency is between 3.1 and 5.1 GHz.

18. A method of performing a clear channel assessment in a wireless network, as recited in claim 15, wherein the base center frequency is 8.208 GHz.

19. A method of performing a clear channel assessment in a wireless network, as recited in claim 15, wherein the base center frequency is between 6 and 10.6 GHz.

20. A method of performing a clear channel assessment in a wireless network, comprising:

listening for channel energy on a wireless channel;

generating a first base oscillating signal having a base center frequency;

generating a second base oscillating signal that is identical to the first base oscillating signals, but shifted in phase by 90 degrees;

mixing the channel energy with the first base oscillating signal to obtain a non-synchronized in-phase component;

mixing the channel energy with the second base oscillating signal to obtain the non-synchronized quadrature phase component;

generating a first corrective oscillating signal having a corrective center frequency;

generating a second corrective oscillating signal that is identical to the first corrective oscillating signals, but shifted in phase by 90 degrees;

mixing the non-synchronized in-phase component with the first corrective oscillating signal to obtain a corrected non-synchronized in-phase component;

mixing the non-synchronized quadrature component with the second corrective oscillating signal to obtain a corrected non-synchronized quadrature component;

squaring the corrected non-synchronized in-phase component;

squaring the corrected non-synchronized quadrature phase component;

multiplying the non-synchronized in-phase component and the non-synchronized quadrature phase component to produce an I-Q product;

subtracting the squared non-synchronized quadrature component from the squared non-synchronized in-phase component to produce a first intermediate value;

doubling the I-Q product to produce a second intermediate value;

adding the first intermediate value and the second intermediate value to produce a clear channel assessment input value;

performing a carrier signal detection function on the clear channel assessment input value to produce a clear channel assessment output value; and

using the clear channel assessment output value to determine whether a signal is present in the wireless channel.

21. A method of performing a clear channel assessment in a wireless network, as recited in claim 20, wherein the I-Q product is used to adjust the corrective center frequency.

22. A method of performing a clear channel assessment in a wireless network, as recited in claim 20, wherein the base center frequency is 4.104 GHz.

23. A method of performing a clear channel assessment in a wireless network, as recited in claim 20, wherein the base center frequency is between 3.1 and 5.1 GHz.

24. A method of performing a clear channel assessment in a wireless network, as recited in claim 20, wherein the base center frequency is 8.208 GHz.

25. A method of performing a clear channel assessment in a wireless network, as recited in claim 20, wherein the base center frequency is between 6 and 10.6 GHz.

26. A method of performing a clear channel assessment in a wireless network, as recited in claim 20, wherein the corrective center frequency varies between zero and 100 MHz.

27. A method of performing a clear channel assessment in a wireless network, as recited in claim 20, wherein the carrier signal detection function is a fast Fourier transform function.

28. A method of performing a clear channel assessment in a wireless network, as recited in claim 20, wherein the carrier signal detection function is a decimated fast Fourier transform function.

29. A method of performing a clear channel assessment in a wireless network, as recited in claim 20, wherein the carrier signal detection function is a band pass filtering function.

30. A method of performing a clear channel assessment in a wireless network, as recited in claim 20, wherein the step of using the clear channel assessment output value to determine whether a signal is present in the wireless channel is performed by determining if the clear channel assessment output value is greater than a set threshold value.

31. A method of performing a clear channel assessment in a wireless network, as recited in claim 20, wherein the step of listening for channel energy further comprises: performing a variable gain amplification function on the channel energy before the channel energy is demodulated.

32. A method of performing a clear channel assessment in a wireless network, as recited in claim 31, further comprising:

performing an absolute value function on the clear channel assessment input value to produce a feedback signal,

wherein the feedback signal is used to control the variable gain amplification function.

33. A method of performing a clear channel assessment in a wireless network, as recited in claim 20, further comprising: filtering any frequency components in the non-synchronized in-phase component above a low pass threshold before the step of mixing the non-synchronized in-phase component with the first corrective oscillating signal.

34. A method of performing a clear channel assessment in a wireless network, as recited in claim 20, further comprising: filtering any frequency components in the non-synchronized quadrature phase component above a low pass threshold before the step of mixing the non-synchronized in-phase component with the second corrective oscillating signal.